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of the Observatory. Notwithstanding a careful scrutiny, I did not succeed in observing the thorn-like projections of light seen on the solar cusps by Captain Noble and others during the eclipse of September last. The eclipse, which was equal to about one-third of the Sun's diameter, had an interesting effect on a black-bulb thermometer enclosed in an exhausted glass globe.

Windsor, New South Wales,
1876, *Sept.* 21.

Observations of the Lunar Eclipse, 1876, *September* 3, *made at Cadiz*. By Augusto T. Arcimis.

At 7^h I commenced the observations. The state of the atmosphere was magnificent, not a single cloud was visible above the horizon, nor was the slightest breeze perceptible, the sky having an extraordinary and exceptional purity. To the west were visible the last glimmers of the twilight. I made use of a 4-inch refractor (by Secretan of Paris), with an astronomical eyepiece, of the power of 92 diameters. To sketch the projection of the terrestrial shadow I employed a reduced map of the Moon of Beer and Mädler and some photographs of Mr. Warren De La Rue, which I kept constantly before me.

The hours are according to Cadiz mean time; the geographical co-ordinates of my observatory are:

Lat. N. = $36^\circ\ 31'\ 52''\!\cdot\!8$;
Long. W. Greenwich = $0^{h}\ 25^{m}\ 11^{s}\!\cdot\!7$.

At $7^h\ 15^m$ I saw the penumbra which concealed the Oceanus Procellarum, Mare Imbrium, Sinus Æstum, and Mons Carpathus.

At $7^h\ 40^m$ I could see with the naked eye that the light was scarce in the NE. quadrant (invert. vis.) and took a reddish tint.

At $7^h\ 50^m$ (hour of the first contact) the shadow reached the peak Cleostratus (although of the precise moment I am somewhat doubtful), and enlarged itself rapidly to Mons Harpathus and Sinus Proris. Five minutes later I could see with great facility the shadow with the naked eye.

I then applied the spectroscope to the refractor, directing it to the crater Lavoisier; the common solar spectrum appeared as it was expected, but as the shadow advanced and the light became fainter, I detected some of the absorption lines on the red, produced by the Earth's atmosphere.

At $8^h\ 5^m$ the limits of the shadow are, to the east, 38° lat. N., craters Lavoisier, Mairan, Plato, Archytas, Mayer; and ends to the west in 82° lat. N.

I applied again the spectroscope, and in the

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darkest part of the lunar disk the spectrum was little visible on account of want of light, but near the limits of the shadow I found the telluric lines on the red, between D and F, and above all between F and C, where they became very numerous.

At 8^{h} 20^{m} the limit of the shadow crossed the 28° lat. N., on the east, craters Briggs, Diophantus, on the middle of Mare Imbrium, crater Autolycus, Palus Nebularum, crater Burg, Lacus Mortis, crater Endymion, and ends to the west in 60° lat. N.

At 8^{h} 32^{m} the shadow reaches the crater Aristarchus; this was its highest point, on the NE. quadrant.

At 8^{h} 41^{m} the light appeared again upon this crater, and the shadow pursued its descending path.

At 8^{h} 50^{m} the shadow is bounded to the east by 34° lat. N., crater Euler, Mons Apenninus, Hœmus, crater Macrobius, the boreal edge of Mare Crisium, and finished to the west by 30° lat. N.

At 8^{h} 57^{m} time of the middle of the eclipse, according to the Ephemeris, and the shadow begun to the east by 36° lat. N., craters Euler, Manilius, on the middle of Mare Vaporum, crater Vitruvius, and ends to the west by 22° lat. N.

At 9^{h} 6^{m} the limits were, to the east, 40° lat. N., craters Diophantus, Euler, Pytheas, Manilius, Palus Somnii, crater Picard in Mare Crisium, and ended to the west in 18° lat N.

The neighbourhood of the boreal pole which was the darkest, had an orange colour, and the other parts of the shadow were of a livid white, similar to the light of *Saturn*.

I made another analysis with the spectroscope; some of the telluric lines on the violet had disappeared, but those on the red remained very visible.

At 9^{h} 24^{m} the shadow is bounded to the east by 56° lat. N., craters Cleostratus, Sharp, somewhat to the north of Archimedes, Palus Putredinis, craters Menelaus, Jansen, Condorcet, and ends to the west in 12° lat. N.

At 9^{h} 49^{m} the limits are, to the east, 66° lat. N., craters Pythagoras, La Condamine, at half the distance of Harpathus and Senopidus, on the middle of Mare Serenitatis, crater Proclus, Mare Crisium, crater Agarum, and ends to the west by 16° lat. N.

At 10^{h} 4^{m} the last contact took place, with the shadow very near Mare Humboldtianum by 53° lat. N. on the NO. quadrant.

It seems to me that I can point out a small difference in this last contact between the observation and the Ephemeris; those which I have made use of are published here under the title of *Nautical Almanac.*

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